RIRDC Completed Projects in 2003-2004 and Research in Progress as at June 2004

Sub-Program 1.3

Asian Foods

October 2004

RIRDC Publication No 04/068
Foreword

RIRDC has produced Research in Progress, as at June 2004, which contains short summaries of continuing projects as well as those that were completed during 2003-2004 for all of the Corporation’s 20 program areas. The complete report on all the programs is only available in electronic format on our website at http://www.rirdc.gov.au

The following report is a hardcopy extract covering Sub-Program 1.3, Asian Foods. It contains all entries from continuing and completed Asian Foods research projects funded by RIRDC. This program aims to foster the development of a viable Asian Foods industry in Australia.

This report is the newest addition to our extensive catalogue of over 1000 research reports, videos and CD-Roms of projects supported by RIRDC. Please contact us for the latest publications catalogue or view it on our website:
• downloads at www.rirdc.gov.au/reports/Index.htm
• purchases at www.rirdc.gov.au/eshop

Simon Hearn
Managing Director
Rural Industries Research and Development Corporation
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<td>(07) 4930 9770</td>
<td>Central Queensland University</td>
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## 2.1 ASIAN FOODS
### COMPLETED PROJECTS

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<td>(08) 8999 2219</td>
<td>NT Dept of Business, Industry and Resource Development</td>
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<td>(03) 9210 9222</td>
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<td>Mr. Dennis Murphy</td>
<td>(07) 4936 0235</td>
<td>Dept of Primary Industries (QLD)</td>
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**RIRDC RESEARCH IN PROGRESS 2004**

**Industry Development**

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<tr>
<td>Researcher:</td>
<td>Dr David Hall</td>
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</table>
| Organisation: | NSW Department of Agriculture  
Gosford Horticultural Institute  
Locked Bag 26, GOSFORD NSW 2250 |
| Phone: | (02) 4348 1944 |
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**Objectives**

- Adoption of best practices by Vietnamese vegetable growers;
- Increased economic viability of Vietnamese vegetable growers due to improved market access;
- Increased consumer confidence in safety of Asian vegetables;
- Detailed understanding of the information requirements and priorities of a specific Non English Speaking Background (NESB) grower groups;
- Socially, more empowered, less isolated Vietnamese vegetable growers accessing information and negotiating for their local community;
- More environmentally sustainable vegetable production in the Sydney region;
- Verification of the transportability of the communication and extension model piloted in Northern Territory (DAV-176A).

**Current Progress**

A range of Asian and other vegetables are produced by Vietnamese growers on small farms on the western outskirts of Sydney. The aim of this project is improved communication to improve economic sustainability of these farmers. The communication officer, Ho Dang, who speaks Vietnamese and English and has training in agronomy and entomology, commenced in August 2003. He subsequently conducted semi-structured interviews with 30 growers, covering crop, farm and business data; grower skills and attitudes; and grower needs. The comprehensive survey report provides benchmarks to evaluate the projects’ success.

On average, farmers grow 8 and up to 17 different vegetable types. The most popular are eggplant, chilli, bitter melon, tomato and snake beans. Farms range from 1 to 15 ha. Fifty three percent of growers have greenhouses; 47% farm only in open fields; the majority lease land.

From September 2003 to April 2004 there have been 15 training days for groups as workshops and field days covering fertiliser usage, integrated pest and disease management, water use efficiency and batch farm management planning with 80% of contacted growers attending at least one major training course. The communication officer has also visited most individual farms and helped provide advice on horticultural issues.
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<td><strong>Researcher:</strong></td>
<td>Mr Geoff Walduck</td>
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<td>Department of Business, Industry and Resource Development (NT) PO Box 3000 DARWIN NT 0801</td>
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<td><strong>Phone:</strong></td>
<td>(08) 8999 2219</td>
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<td><strong>Email:</strong></td>
<td><a href="mailto:geoff.walduck@nt.gov.au">geoff.walduck@nt.gov.au</a></td>
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**Objectives**

- To facilitate and promote information exchange (formal and informal) between Asian food Project leaders, IDO's, industry representatives and the RIRDC Program Manager.
- Project leaders available to present final and progressive research reports at appropriate industry forums. Formal information exchange documented and available to interested parties.
- Industry issues identified regularly at regional level presented at a national meeting for all parties.

**Current Progress**

The major activity of the project was the organisation and staging of a 2 day meeting of researchers and industry and the Asian Foods Program Manager [Tony Byrne].

The two day meeting was held in Brisbane in June 2004. Day One involved a field trip to Harvest Fresh Cuts factory and processing facility, Woolworths’ distribution centre and three commercial growers. This enabled researchers to discuss industry issues first hand with growers and processors. The second day involved a formal meeting with presentations by Asian Foods researchers on recent progress and research outcomes. This meeting also provided a venue for initial discussion on future priorities for the RIRDC Asian Foods research program.
Objectives

- Production of Product Description Languages for a range of smaller emerging and developing tropical crops in a range of appropriate flexible and inexpensive formats.
- Production of PDLs to be in partnership with all parts of the production/transport/distribution/retail and consumer chain.
- Produce PDLs in electronic format so that they can be customised and modified easily to meet constantly changing market and production conditions. This also allows a range of very short run hard copy formats to be produced at little cost to meet specific requirements as required.
- Develop a system of developing PDLs for a range of related or geographically compact small crops so that PDLs can be produced quickly, inexpensively and be flexible enough to assist the industry to develop in the market place at an earlier stage than is usual at the moment.
- Improve the flow and accuracy of product information flow within and along the market chain.
- Promote more efficient operation of the market chain by improving both the accuracy and the speed of information flow in both directions.
- Improve quality of produce and lead to commercial quality standards as required.
- Enables the possibility of sale by description and e-commerce.

Current Progress

The start of the project was delayed by 6 months due to administrative delays relating to the indemnity clauses in the agreement.

PDLs have been produced for 3 types of Psitcorums[flowers and not part of this project] as a test of the procedures and proved successful. These were done from DBIRD resources. A PDL has been produced for Limes and another for Pitaya [white]. The lime one has been reviewed and is in its final form. The Pitaya one is in the evaluation form and is being reviewed during the winter non cropping season with the final version to be produced after cropping commences in October. The PDL for Okra is currently in production.
## New Products

### Project Title

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<th>Project Title</th>
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<td>Mr Andrew James</td>
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<tr>
<td>Organisation:</td>
<td>CSIRO Plant Industry</td>
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<td>120 Meiers Road</td>
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<td>INDOOROOPILLY QLD 4068</td>
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<td>(07) 3214 2278</td>
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<td>Fax:</td>
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<td>Email:</td>
<td><a href="mailto:andrew.james@csiro.au">andrew.james@csiro.au</a></td>
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### Objectives

This work seeks to develop a critical understanding of the ripening process in CSIRO-bred and elite Japanese cultivars of edamame soybean, and in particular, to understand how changes in seed size and the seed content of protein, oil, sugars (fructose, glucose, sucrose, raffinose and stachyose), vitamins (A, D and E) and isoflavones (genistein, diadzein and glycitein) vary with ripening and maturation environment. This knowledge will be used to develop strategies to ensure consistent supplies of excellent quality edamame to high-value markets in Australia initially and overseas.

### Current Progress

The project is on schedule, trials were planted at Lowood and at Gatton, good establishment was achieved. Phenology was recorded and sequential harvests for later analysis of sugars were made of edamame during grain fill. Several techniques for assessment of harvest timing were tested & included penetrometer and refractrometer measurements. The usefulness or otherwise of these methods will be determined once laboratory analysis of the sugars has been performed.
Objectives

The main outcome will be the establishment of an entirely new industry involving producers, processors and exporters. The mume industry will generate new jobs and will replace current imported product. The R&D objectives are:

- To determine new markets, potential competitors and to quantify the business economics of the agri-supply chain in the production and marketing of processed mume products (salted plums, mume sauces, umeboshi and umeshu).
- To study the adaptation, cropping and agronomy of mume in Australia and determine potential yields, consistency of supply and make recommendations on suitable varieties.
- To evaluate mume as a genetic bridge in the development of other Prunus species and create novel products for processing.

Current Progress

Prunus mume, commonly called Japanese apricot, is widely grown in Asia and the fruit are consumed as umeboshi (pickled), umeshu (wine) or as a dried salty plum. Mumes are not grown commercially in Australia but mume products are imported. In this project we are studying the potential of a mume industry by investigating the agronomy, marketing and economics of mume production. Agronomic evaluation trials of 5 mume cultivars were planted at Mareeba, Stanthorpe and Nambour in Queensland and Bangalow in NSW in 2004. Domestic market research was conducted by interviews with importers, wholesalers, retailers, hotel chefs and manufacturers and by a product audit in key markets. With no promotion of the imported products the Australian market is currently small and the products are being sold at medium prices ($10/kg for salty plums and up to $60/kg for high quality umeboshi). Our industry partner considers there is sufficient demand for salty plums to continue investigation and has produced trial product lots from the 2004 mume harvest. In 2004-2005 the Japanese market will be investigated (Japan is the largest consumer of umeboshi, importing 42,587 tonnes in 2000) and an economic evaluation of on-farm production will be completed.
### Objectives

- Identification of key crucifer species which could form the basis of industry sales on health rather than culinary issues, similar to broccoli sprouts in the USA. Identification and quantification of demonstrated anti-cancer glucosinolates in Asian crucifers. Provision of advice or recommendations on a pathway for addressing the regulatory issues relating to anti-cancer claims.

- The research has an aim to promote the consumption of Asian vegetables by broadening the consumer base through sales to people who would not have purchased Asian vegetables on a culinary basis (i.e. flavour). A second and underlying issue is to identify products that will reduce the incidence of internal cancers in the Australian community.

### Current Progress

An accurate and replicable HPLC procedure has been optimised for the identification and quantification of glucosinolates in seed material, and is being presently optimised for sprouts and mature tissue. To date, 25 crop species have been analysed for glucosinolate composition, identifying a total of 21 glucosinolates present in significant quantity. The number of glucosinolates identified in each species was variable (1-10), with a median value of 4. Glucosinolates included 10 alkylthioalkyl-, 6 olefin-, 3 aryl-, and 2 indole-glucosinolates. The anti-cancer potential of each of these compounds (based on the concentration of a compound required to double the quinone reductase specific activity in Hepa 1c1c7 murine hepatoma cells) has been determined from the scientific literature. Species investigated included 12 east-Asian species, 2 west-Asian species, 9 European/Mediterranean species, and 2 American species.
**Objectives**

- Tasmania will become the major supplier of premium fresh wasabi to the Australian market replacing currently imported product and also commence exporting to other Pacific Rim Countries.
- Improvement in yield and product quality will permit expansion of the industry to include South East Asian markets.
- The 'Wasabi Production Guide' will be revised, updating cultural practises to include aquatic production.

**Current Progress**

- Fresh wasabi stems and leaves from Tasmanian soil-grown selections are currently supplied to outlets in Sydney, Melbourne and Hobart. Whilst Tasmania benefits from having product available year-round, demand for fresh wasabi exceeds supply, making expansion of the Tasmanian wasabi industry a priority.
- The value-added product ‘Wild Wasabi Cheese’ incorporates dried stems and leaves of Tasmanian wasabi and has been marketed in Australia, Japan and USA.
- Research has focused on the development of water-grown wasabi, which commands a premium price in the fresh market. In February 2004, ‘Wasabi Growers of Tasmania Pty Ltd’ established Stage 1 of the first water-grown wasabi farm in Tasmania. Planting stock was sourced from high quality Japanese selections. ‘Wasabi Growers of Tasmania Pty Ltd’ currently source and distribute wasabi planting stock for other Tasmanian growers.
- Research also includes a fungicide trial to assess the potential for yield and product quality improvements in both soil and water-grown wasabi crops and a trial to refine specific requirements for wasabi in water-culture. Information from current research will be included in the revised edition of the ‘Wasabi Production Guide’.

The newsletter ‘Wasabi News’ advises clients of recent progress in the developing Tasmanian wasabi industry.
**Project Title**

Adding value to Asian vegetables through easier meals for households

**RIRDC Project No.:** FSA-2A  
**Start Date:** 01-Aug-01  
**Finish Date:** 31-Jul-04  
**Researcher:** Dr Mala Gamage  
**Organisation:** Food Science Australia  
Packaging & Coatings Section  
Private Bag 16  
WERRIBEE VIC 3030

**Phone:** (03) 9731 3471  
**Fax:** (03) 9371 3250  
**Email:** mala.gamage@foodscience.afisc.csiro.au

**Objectives**

- Enhance Australian Asian vegetable industry and its productivity by maximising processing opportunities.  
- Asian vegetables identified for the development of "ready to heat and serve" meal components that are convenient and easy to incorporate into a family meal situation.  
- Introduction of the average Australian household to Asian vegetables, without the apprehension caused by not knowing the correct method of preparation.  
- Establishment of product, process, packaging storage and handling protocols for three pre-prepared meals for commercial adoption by processors.

**Current Progress**

This three-year RIRDC and DPI-V co-funded project aims to introduce convenient "ready-to-use" Asian vegetables into more Australian households. As previously reported, suitable Asian vegetables for new product development were identified and five concept products were developed. Consumer evaluation judged Asian salad and stir-fry mixes to be generally acceptable with strong positive responses attributed to the unique flavour and odour of specific Asian vegetables.

During 2003, Food Science Australia and Convenience Foods, produced pilot-scale batches of salad and stir-fry products using a variety of Asian vegetables. The packaged salad and stir-fry mixes were stored at three different temperatures (2°C, 4°C and 7°C) and sensory and microbiological assessments were carried out at different storage time intervals. In general, storage at lower temperatures showed longer extension of shelf life and most Asian vegetables stored at 2°C had a shelf life of 14 days. The primary governing factors for achieving an extended shelf life were initial product quality, low temperature storage and appropriate MAP conditions.

In May 2004 a semi commercial production trial was conducted to validate the observations made in 2003 by Food Science Australia on sensory and microbiological qualities of Asian stir-fry and salad. In addition the shelf life of an Asian vegetable salad formulated by Convenience Foods Pty Ltd was evaluated as the third product. The effects of storage temperature (4°C and 7°C) on shelf life of all three products and a packaging variation on one selected product were also evaluated.
**Project Title**

Development of taro, yam, yam bean and sweet potato exports to Japan and USA

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**RIRDC Project No.:** UCQ-13A  
**Start Date:** 01-Jan-01  
**Finish Date:** 30-Sep-04  
**Researcher:** Prof David Midmore  
**Organisation:** Central Queensland University  
School of Biological and Environmental Sciences  
ROCKHAMPTON QLD 4702

**Phone:** (07) 4930 9770  
**Fax:** (07) 4930 9255  
**Email:** d.midmore@cqu.edu.au

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**Objectives**

- Investigate markets, define required quality attributes, to establish a supply chain for the successful export of taro, yam, yam bean and/or sweet potato to Japan and/or USA. In parallel, ensure the group of producers and suppliers has the capacity to stand alone for exporting and diversifying from these commodities.

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**Current Progress**

Six Japanese varieties of sweet potato have been released from quarantine into the Qld DPI&F sweet potato program, and will undergo initial field trials in September 2004. Two other Japanese sweet potato varieties are still in the virus-elimination program, and are likely to be released in 2005. Nine Japanese cultivars of sato-imo (small-corm taro) are undergoing virus testing and tissue culture multiplication for import to Australia. The contacts established for this exercise will also be useful for importing new cultivars for the large-corm taro industry.

Field trials of sato-imo cultivar “NORADA 1” that were harvested in 2003 investigated plant spacing and nutrition. Further trials established in 2003 are for further investigation of plant nutrition, water use, and best crop management practices.

Commercial quantities of “NORADA 1” sato-imo were available in northern NSW and southern Qld in 2003. A group of NSW growers linked with a commercial exporter to send samples and a trial shipment of 1000 kg of fresh sato-imo to Japan in June. There was positive feedback about quality of the corms, with recommendations for improving external appearance (eg. growing in lighter coloured soils) and improving grading consistency. Market timing and price issues inhibited further shipments in 2003 and so far in 2004.

Growers that contributed to the trial shipment, and sold product domestically, believe that the main issues that need addressing are reduction of production costs (through mechanisation, and generally more efficient practices), expansion of the domestic market for fresh and semi-processed/value-added products, and further exploration of export markets inside and outside of Japan for fresh and value-added products.
Project Title | New Asian vegetables for domestic and overseas markets
---|---
RIRDC Project No.: | AMR-8A
Start Date: | 01-Jul-2002
Finish Date: | 28-Feb-2003
Researcher: | Mr. Grant Vinning
Organisation: | Asian Markets Research
| PO Box 371
| SUMNER PARK QLD 4074
Phone: | (07) 3376 2244
Fax: | (07) 3376 7264
Email: | grant.vinning@asianmarketsresearch.com.au

**Objectives**

- The objective is to increase the prospects for selected Asian vegetables to be grown in Australia by providing an analysis of the domestic and international markets.
- The outcomes of the project will be:
  - The development of a marketing-based methodology by which to proceed with developing selected Asian vegetable(s) and
  - Price profiles of select Asian vegetables.
  - The establishment of quality parameters.
  - An identification of the marketing chain.
  - The identification of the major supply chain management issues.
- The deliverables will be:
  - a report outlining the methodology used to select vegetables for further study and the results of its application; and
  - individual product market profiles published through Access to Asian vegetables.

**Current Progress**

The project has developed three suites of criteria that form an ex-ante assessment to ranks the likelihood of success of around 30 Asian vegetables in five markets.

One suite relates to the production-based issues of seasonality as it affects market window, and actual size of production. The latter is needed as this affects logistics which in turn affect market prospects.

A second suite of criteria relate to the direct market issues of price and quarantine. Price is all important as it determines the profitability of the venture. As price is determined in the target market by a combination of local supplies and imports, access to means of assessing these becomes an important issue. Quarantine determines a “go/no go” situation. However as quarantine is rarely fixed in that standards are changing as is the degree of science available to meet quarantine standards, an assessment of the permanency of quarantine has to be made.

The third suite of criteria relate to factors that reduce market risk. The project quantifies four - spread of markets, size of markets, value–adding, and logistics.

The project is now developing hurdle rates for around 30 Asian vegetables for markets in Australia, Singapore, Hong Kong, Taiwan, and Japan.
## Project Title

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<td>Mr Craig Lemin</td>
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<td>Organisation:</td>
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<td>Email:</td>
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</tr>
</tbody>
</table>

### Objectives

- Investigations for development of washing/cleaning equipment for esculenta and antiquorum taro.
- Trialing/demonstration of potato diggers in taro for mechanization of harvest.
- Trialing/demonstration of planters in taro for mechanisation of planting.
- Review current, attempted and envisaged practices in relation to taro mechanisation in Australia and overseas.
- Investigate techniques for mechanized recovery of antiquorum taro.
- Reporting and liaison with industry on above.

### Current Progress

**Washing and cleaning equipment**

- A test washer for esculenta taro was assembled and trialed in January. This rig had chook plucking fingers mounted on a rotating drum, which acted on the taro corms (held by hand). The machine removed soil from the corms and a high proportion of the roots without causing damage to the skin. This provided the confidence to design a full-sized machine using the same principle. The design is now completed, components purchased and the machine is being fabricated. It will incorporate a roller conveyor to slowly rotate the corms as they pass beneath a series of rotating drums (with plucking fingers attached). The speed and aggressiveness of the plucking fingers can be adjusted. Water jets will also be installed. Design throughput can be varied from about 10-35 corms per minute. It is expected that the machine will be operational by the end of July or earlier.

- In early June it is hoped to revisit the grower in northern NSW who imported cleaning equipment for antiquorum taro from Japan. It appears that another root cutter machine has been imported and used.

**Harvesting equipment**

The taro-digging machine modified before Christmas has only recently been tested on a grower’s farm. Prolonged wet season rains prevented earlier use. The grower reports that the machine is now digging satisfactorily and elevating the taro up the conveyor. However blockages can occur at the inlet and outlet of the conveyor. This will be investigated however funds for further modification of the machine are now largely exhausted.

**Production systems and review**

It is anticipated that the RIRDC project “Taro Industry Development: The First Step” will commence in July 2004 – this project will undertake an on-farm survey of Australian taro growers including current practices,
problems and perceived production and information needs etc. Input will be provided to the survey questionnaire so that information on production practices relevant to mechanization can be gathered (even if mechanization is not practiced).
<table>
<thead>
<tr>
<th><strong>Project Title</strong></th>
<th><strong>Asian vegetable pest, disease and weed management strategy</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>RIRDC Project No.:</strong></td>
<td>UCQ-19J</td>
</tr>
<tr>
<td><strong>Start Date:</strong></td>
<td>01-Apr-04</td>
</tr>
<tr>
<td><strong>Finish Date:</strong></td>
<td>30-Sep-04</td>
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<tr>
<td><strong>Researcher:</strong></td>
<td>Prof David Midmore</td>
</tr>
<tr>
<td><strong>Organisation:</strong></td>
<td>Central Queensland University&lt;br&gt; School of Biological and Environmental Sciences&lt;br&gt; ROCKHAMPTON QLD 4702</td>
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<td><strong>Email:</strong></td>
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</tbody>
</table>

### Objectives

- With major concentrations of growers, to develop a prioritised inventory of major pests (read=pests, diseases and weeds) affecting Asian vegetables, and Herbs and Spices, the currently acceptable methods for management, and indications of needs for registration for off-label use of appropriate chemical and non-chemical management. To promote the various management options, especially non-chemical approaches.

### Current Progress

- A standard workbook has been prepared for the workshops to encompass the common, less-common and localised pests in the various industries. To date we have held two workshops, one in Brisbane and one in Cairns. Through these two workshops, we have found that there is a vast range of insect pests, diseases and weeds on Asian vegetables, herbs & spices, and we have prioritised these according to the extent of damage they cause to these crops. The range of damage by these pests in some crops varies from 5-100%. We have come across many constraints in the production, pest management, chemical access, market access, legislation and lack of R&D for the Asian vegetable, herb and spice industries. The dates and venues for the remainder of the workshops nationwide have been decided and invitations have already been sent out to the relevant growers, researchers and industry personnel to participate and share their ideas in person with us so that we can further prioritise all known and indications of potential pests of these industries. This integrates the importance of the crop, the pest and the dollar value of current and potential damage, and will be used to determine priorities for research into chemical and non-chemical management options. For those unable to attend workshops in person, especially researchers, we will undertake interviews over the phone and/or by email.
Completed Projects 2004

Industry Development

<table>
<thead>
<tr>
<th>Project Title:</th>
<th>Improving interaction and communication between RIRDC Asian foods project leaders and industry (stage 1)</th>
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</thead>
<tbody>
<tr>
<td>RIRDC Project No.:</td>
<td>DNT-28A</td>
</tr>
<tr>
<td>Researcher:</td>
<td>Mr Geoff Walduck</td>
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<tr>
<td>Organisation:</td>
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<tr>
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</tr>
</tbody>
</table>

**Objectives**

- Information exchange (formal and informal) between Asian food project leaders, industry and RIRDC Program Manager enhanced.
- Project leaders available to present final and progressive research reports at appropriate industry forums.
- Formal information exchange documented and available to interested parties.
- Industry issues identified regularly at industry forums.

**Background**

Communication of research results is the most important part of research projects. This project coordinates a yearly meeting consisting of a regional tour, research report and a grower seminar, increasing the exchange of information between growers and researchers in Asian foods.

**Research**

The first meeting of the project took place at Murwillumbah in May 2001 and was jointly arranged with the Northern Rivers Agricultural Development Association with the support of the local State and Regional Development office. 130 people, including 100 growers or potential growers attended a seminar dealing with a range of Asian vegetable industries.

The second meeting was held in Geelong in June 2002, involving researchers, industry leaders and the RIRDC program manager. Some 16 researchers attended workshop sessions, met with industry leaders and held discussions during a field trip to growing areas near Werribee.

The third meeting was held in June 2003 at Gosford Research Station (NSW Agriculture) at which researchers presented reports on current work, and industry problems and opportunities were discussed. This was followed by a one-day field trip to growing areas of western Sydney where researchers and the RIRDC Manager interacted with growers on their properties and saw first hand the local issues. This also allowed for informal interaction between all parties.

**Outcomes**

Improved communication of progress and outcomes of RIRDC research projects to industry. Improved understanding of industry issues and information needs by Asian foods researchers. Greater cooperation amongst Asian foods researchers.

**Implications**

More effective research outcomes.
**Project Title:** Industry development for Asian vegetables in north Queensland

**RIRDC Project No.**: DAQ-270A  
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**Objectives**

- Coordination and dissemination of results of existing R&D in the Asian vegetable industry / integrate information sharing in North Queensland
- Improved understanding of the Asian Vegetable Industry and the prospects for wider adoption in North Queensland.
- Promotion of the utilisation of Asian Vegetable farming systems.
- Regional North Queensland Industry Development Seminars illustrating Asian vegetable farming systems.
- The production of information manuals for distribution at the Industry Development Seminars.
- Establishment of a working group to progress Asian Vegetable Industry Development in North Queensland.

**Background**

The existing economy of North Queensland is based primarily on two sectors – primary industries and tourism and will be stronger if it diversifies into other areas. Depressed prices for conventional vegetables produced in the region, changing consumption patterns and the geographical location of North Queensland all lead to the great potential for a viable Asian Vegetable Industry. Diversification will help to provide more jobs, more choice and greater economic stability in the region.

**Research**

An Industry Advisory Committee was firstly established. Desktop research was conducted to access information from secondary sources on past and current Asian Vegetable research. The QDPI team members also worked closely with industry participants to identify agronomic, economic and market features of the Asian Vegetable industry. From the preliminary research, relevant information was collated for compilation into the Asian Vegetable Industry Information Manuals. Relevant speakers for the Industry Development Seminars were also identified. Regional seminars were conducted in Mackay and Townsville. Four key speakers were allocated an equal amount of time to address the three core topics on the agenda - markets, agronomics and economics. All industry development seminar participants received a copy of the Information Manual.

**Outcomes**

All objectives of the project were met. The seminars were well attended (approx 90 people attended over the two days) and written feedback suggested that the information was well received. A number of growers formed groups in the two regional areas. A group of growers in the North Queensland Tablelands have progressed with on farm trials.

**Implications**

The project has highlighted the strong need for the provision of more information on diversification opportunities and the high level of interest in Asian Vegetable production throughout the North Queensland region.

**Publications**

RIRDC Pub. No 04/018
# Project Title: National Asian foods newsletter - publication and evaluation

<table>
<thead>
<tr>
<th>RIRDC Project No.:</th>
<th>DAV-206A</th>
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</thead>
<tbody>
<tr>
<td>Researcher:</td>
<td>Mr Graeme Thomson</td>
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</tbody>
</table>
| Organisation:      | Department of Primary Industries (Vic)  
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## Objectives
To produce (write, edit, publish) a new national newsletter for effective communication, networking and transfer of information in the Australian Asian vegetable/food industry, and to evaluate the impact of the Access-to-Asian Vegetables/Foods newsletter.

## Background
The *Access to Asian Vegetables / Foods* newsletter has been published in one form or another for nearly seven years. The national newsletter keeps growers, food processing businesses, wholesalers, retailers, exporters and researchers informed of industry developments. It plays a vital role in facilitating the communication of research findings to the people and companies that can drive change in the industry. As well as publishing the 2003 / 2004 newsletter this project objectively evaluated the impact of the newsletter on adoption of new knowledge and practices by the Asian vegetable / food industry.

## Research
Evaluation of the past performance of the newsletter was carried out using a number of strategies developed in an evaluation plan based on Bennett's Hierarchy. Components of the evaluation included:
- An industry survey to gather objective and subjective information on newsletter impact.
- “Good News Stories” to demonstrate outcomes and changes in industry practices.
- A stakeholder questionnaire to gather opinions of the achievements of the project.

These evaluation strategies took into account budget and time constraints, diversity of the target group and the widespread location of subscribers across Australia.

## Outcomes
The project evaluation demonstrated that information provided to the Asian vegetable / food industry via this publication has had a significant impact in changing production and handling practices, as well as on increasing the level of knowledge and understanding within the target audience of 750 subscribers.

## Implications
Access to the newsletter improved the knowledge and skills of 97% of subscribers, as well as accelerating and increasing uptake of more efficient and sustainable practices in 57% of cases.

Positive impacts of the newsletter on social, economic and environmental outcomes were demonstrated in the survey results. These included higher profits and sales; better business decision making; and, reductions in on-farm chemical and water inputs resulting in a more
<table>
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<th>Publications</th>
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<tr>
<td>sustainable industry. In general, subscribers found that the newsletter was an excellent publication and an effective extension and communication tool for the Asian vegetable / food industry.</td>
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<tr>
<td>RIRDC publication to be advised.</td>
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</table>
**Project Title:** Supply chain management, strategy and industry development for the commercial bamboo industry

<table>
<thead>
<tr>
<th>RIRDC Project No.:</th>
<th>UQ-87A</th>
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<tr>
<td>Researcher:</td>
<td>Associate Professor Ray Collins and Steven Keilar</td>
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<tr>
<td>Organisation:</td>
<td>The University of Queensland, School of Natural and Rural Systems Management</td>
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</table>

**Objectives**
The primary purpose of this research is to study how supply chain management principles can contribute to the development of a successful fresh bamboo shoot industry in Australia.

**Background**
Bamboo shoots could become an important contributor to Australia’s minor vegetable production and an important export commodity. The last decade has seen strongly increasing interest in the growing of bamboo in Australia. Several industry pioneers have researched and obtained bamboos from around the world and an industry group, the ACBC (Australian Commercial Bamboo Corporation), has been founded through the work of these pioneers.

Supply chain management has been implemented in a wide range of agricultural industries around the world (Hughes and Merton 1996; Fearne and Hughes 1999), but Mowat and Collins (2000) are the only authors to have considered the role of supply chain management in new and emerging horticultural industries.

Gifford et al. (1998 p. 8) identified supply chain management as “an integrated approach that aims to satisfy the expectations of consumers, through continual improvement of processes and relationships that support that efficient development and flow of products and services from producers to consumers”. The use of supply chain management in new horticultural industries could provide the same benefits as in established industries.

In summary, new horticultural industries can play a role in improving Australian horticulture’s overall performance, including its international competitiveness. The bamboo industry is an emerging horticultural industry with some potential. Supply chain management has been highlighted as a means of improving competitiveness, but there is a lack of understanding of how the application of its principles to new industries can contribute to improving competitiveness.

**Research**
This study presents research into the contemporary development of the bamboo shoot industry in Australia. It details strategic intervention in the development of the Australian Commercial Bamboo Corporation between May 1999 and June 2002. The objective of this intervention was to work with a core group of participants, using supply chain management principles, to address limitations to the group’s development. Through supply chain management principles this intervention influenced the group’s structure and culture and led to the empowerment of the ACBC to take responsibility for managing its own activities and gave the group’s members influence over their collective future. The motivation behind this approach was to have the ACBC become a role model for the wider bamboo industry.
The intervention process was grounded in a framework for action based on the need to concurrently manage three areas of new industry development: the development of a consumer orientation, the development of cooperative relationships and the development of effective information and communication systems. This framework, built on theoretical and empirical perspectives, delivered supply chain principles to these three areas of new industry development. Such a framework has never before been reported in literature on developing new and emerging agricultural industries.

The results from the application of this framework to the ACBC demonstrate that the development of supply chain management principles allowed three risks to new industry development to be addressed: lack of accurate information, lack of a market orientation and lack of strategic action and collective vision.

Strategic intervention combined with action learning provided a vehicle for the application of the framework. When applied in this way the supply chain management framework represents an important advance in better understanding the strategic and operational dimensions of new industry development.

Participatory observation and action learning were the core research techniques. They were used to develop a case study in which information pertaining to this strategic intervention in the development of the Australian bamboo industry could be collected, analysed and documented. The primary data source used in the study were the fellow participants in the process.

Outcomes

In 1998 a core group of industry members started this process by forming the ACBC and then obtaining the funding for this project. The success of this core group over the three years of the intervention demonstrates that supply chain management principles can provide an integrative framework for new industry development. In 1999 the project began with a group of just over 40 growers who were interested in developing the bamboo industry into a commercially viable entity. The ACBC is now Australia’s largest bamboo grower group comprising more than 90 members who between them command more than three quarters of the industry’s plantings. For three years the ACBC has been engaged in developing both domestic and export markets for bamboo shoots. Through its domestic brand, ‘Cockatoo Bamboo’, it is now responsible for the majority of domestic trade in high quality fresh bamboo shoots. The ACBC now has an established, grower regulated HACCP based quality system and is in a position to supply its export brand, ‘Kangaroo Bamboo’, to international markets. The ACBC has investigated the potential of five major export markets and is continuing to search for other markets.

The industry’s development is a number of years ahead of where it might be if the ACBC had not set an example for other industry members to follow and, due to the intervention practised as part of this study, the bamboo industry is now in a better position to address future issues than it would otherwise be. The ACBC is in a position where it is capable of taking control of its own future and if it continues on the course that has been set for it, the industry will also continue to develop as it attempts to meet the benchmarks set for it by the ACBC.

Implications

The findings of this study impact on theory, policy and practice involving new horticultural industries. This study of the Australian bamboo shoot industry during its formative years demonstrates that supply chain management principles can provide an integrative framework for new
industry development. This is a single case, so caution must accompany the interpretation of its results. Despite this limitation the case contains valuable lessons for other industries by providing theoretical insights into the phenomenon of new industry development.

Growers and investors in the Australian bamboo industry can benefit from this study through the use of its findings to assess their decision to grow bamboo species. Members and managers of other emerging horticultural industries may also benefit from the lessons the bamboo industry can provide. Lessons about the importance of reliable information, marketing orientation, supply chain and group relationships and action learning could all provide guidance for other new crop industries.

There are also implications for public sector managers. Although I had attempted to disengage myself from the ACBC at the end of three years I was still heavily involved in their day to day activities. The volume and complexity of work that needs to be done over the first years of new industry development requires intervention of the type practised in this research to be implemented over a longer time frame than three years.

Publications

RIRDC publication to be advised.

PhD Submitted; others planned but not yet published.
New Products

<table>
<thead>
<tr>
<th>Project Title:</th>
<th>Commercial taro chip development using agrichain partnerships</th>
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</table>

**RIRDC Project No.:** DAQ-296A  
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**Objectives**

The outcome of this project is to initiate a new value adding industry by developing a value added taro chip product, the process for manufacture and to develop markets for such product nationally and internationally through agrichain partnerships.

The project will deliver:

- An understanding of and relationship in those agrichain partners identified for processed taro markets nationally and internationally,
- An understanding of the market feasibility of introducing a new value added taro product,
- The technical requirements for the manufacture of taro chips for commercial sales.

**Background**

A group of growers with many years of industry experience in the production of taro decided to initiate a taro chip manufacturing plant based on the following assumptions:

- The project would create jobs in areas which suffer from unemployment
- Fresh taro suffers from seasonal fluctuations in price and a taro chip factory could allow growers to achieve more stable income
- Taro chips are very attractive in appearance with a distinctive taste, texture and colour, which may provide attractive marketable attributes

**Research**

Research has been undertaken in four specific areas. The report presents the findings of research in the areas of

- Markets
- Economics
- Processing and technical requirements
- Sensory Evaluation.

**Outcomes**

- Regional markets / distribution chains were identified.
- Acceptable cooking parameters were established ie. chip thickness, oil type, oil temperature, cooking time and salt addition rate.
- The nutritional value and shelf life of taro chips was established.
- Financial analysis indicated that the cost of raw material was the most significant element of the total production cost. The high cost of raw material (fresh taro) had a significant negative impact on viability
- Focus groups and sensory evaluation indicated that consumers found the proposed taro chips acceptable.

**Implications**

- Results from the project have been used by the proponents to refocus efforts on processing cheaper exotic / tropical crops such as cassava and banana.

**Publications**

RIRDC publication to be advised.